

PHILADELPHIA REFINERY REMEDATION ESTIMATE OF POSSIBLE COSTS

Privileged and Confidential

Area of Interest	Site Characterization								Weighted Characterization Cost Estimate
	Limited			Moderate			Detailed		
	Probability	Cost		Probability	Cost		Probability	Cost	
AOI-1: #1 Tank Farm	0	\$150,000		0	\$300,000		1	\$500,000	\$500,000
AOI-2: S. Yard Process Area	1	\$150,000		0	\$300,000		0	\$500,000	\$150,000
AOI-3: Impoundment Area	0	\$150,000		0	\$300,000		0	\$500,000	\$0
AOI-4: #4 Tank Farm	1	\$150,000		0	\$300,000		0	\$500,000	\$150,000
AOI-5: South Tank Field	1	\$150,000		0	\$300,000		0	\$500,000	\$150,000
AOI-6: Chemicals Area	1	\$150,000		0	\$300,000		0	\$500,000	\$150,000
AOI-7: Girard Pt. Process Area	0.5	\$150,000		0.5	\$300,000		0	\$500,000	\$225,000
AOI-8: North Yard	0	\$150,000		0	\$300,000		0	\$500,000	\$0
AOI-9: Schuylkill River TF	1	\$150,000		0	\$300,000		0	\$500,000	\$150,000
AOI-10: West Yard	1	\$150,000		0	\$300,000		0	\$500,000	\$150,000
AOI-11: Deep Groundwater	1	\$150,000		0	\$300,000		0	\$500,000	\$150,000
CHARACTERIZATION SUBTOTAL									\$1,775,000
PROJECT MANAGEMENT/CONSULTING (15%)									\$266,250
CHARACTERIZATION TOTAL									\$2,041,250
Area of Interest	Remedial Implementation								Weighted Remediation Cost Estimate
	Minimal Action		Limited Remediation		Active Remediation		Major Remediation		
	Probability	Cost	Probability	Cost	Probability	Cost	Probability	Cost	
AOI-1: #1 Tank Farm	0	\$500,000	0	\$1,000,000	0	\$3,000,000	0	\$5,000,000	\$0
AOI-2: S. Yard Process Area	0	\$500,000	0	\$1,000,000	0	\$3,000,000	0	\$5,000,000	\$0
AOI-3: Impoundment Area	0	\$500,000	0	\$1,000,000	0	\$3,000,000	0	\$5,000,000	\$0
AOI-4: #4 Tank Farm	1	\$500,000	0	\$1,000,000	0	\$3,000,000	0	\$5,000,000	\$500,000
AOI-5: South Tank Field	1	\$500,000	0	\$1,000,000	0	\$3,000,000	0	\$5,000,000	\$500,000

Investigation of the 26th St border per EI requirements
Additional investigation along Pollock St sewer per EI requirements
No further investigation necessary per AOI 3 RIR dated Sep 27, 2010
Additional investigation along Penrose Ave. per EI requirements
SWMU delineation and indoor air assessment
SWMU delineation and indoor air assessment necessary
SWMU and boundary delineation and indoor air assessment necessary
No further investigation necessary per AOI 8 RIR dated January 31, 2012
Further investigation necessary per AOI9 RIR
Ecological investigation of Land's Creek per RIR dated June 29, 2011
Four quarters of attainment monitoring per RIR dated September 12, 2010

No further remedial measures planned to date
No further remedial measures planned to date
Sunoco requested a comfort letter from USEPA for SWMU 3, Guard Basin, in RIR dated Sep. 27, 2010
Boundary control system required to meet EI's
Removal of lead impacted soil required to close SWMU's 93, 94 and 101

PHILADELPHIA REFINERY

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Area of Interest	REMEDIAL ACTION COST ESTIMATE OF POSSIBLE COSTS									Weighted Remediation Cost Estimate	
	Minimal Action		Limited Remediation		Active Remediation		Major Remediation				
	Probability	Cost	Probability	Cost	Probability	Cost	Probability	Cost			
AOI-6; Chemicals Area	0	\$500,000	0	\$1,000,000	0	\$3,000,000	0	\$5,000,000	\$0	Sunoco requested a final agency determination from USEPA for SWMU's 92 and 95 in SCR dated Sep 29, 2006 Sunoco requested a comfort letter from USEPA for SWMU's 87, 88, 89, 90 and 91 in RIR/Cleanup Plan dated Feb 29, 2011 Sunoco requested a comfort letter from USEPA for SWMU 2, Lead Weathering Pad in RIR dated Jan 31, 2012 No further remediation is currently planned Sunoco requested a comfort letter from USEPA for SWMU 1, West Yard, in RIR dated June 29, 2011 No remediation necessary per RIR dated Sep. 12, 2011	
AOI-7: Girard Pt. Process Area	0	\$500,000	0	\$1,000,000	0	\$3,000,000	0	\$5,000,000	\$0		
AOI-8: North Yard	0	\$500,000	0	\$1,000,000	0	\$3,000,000	0	\$5,000,000	\$0		
AOI-9: Schuylkill River TF	0	\$500,000	0	\$1,000,000	0	\$3,000,000	0	\$5,000,000	\$0		
AOI-10: West Yard	0	\$500,000	0	\$1,000,000	0	\$3,000,000	0	\$5,000,000	\$0		
AOI-11: Deep Groundwater	0	\$500,000	0	\$1,000,000	0	\$3,000,000	0	\$5,000,000	\$0		
REMEDIAL SUBTOTAL									\$1,000,000		
PROJECT MANAGEMENT/CONSULTING (15%)									\$150,000		
REMEDIAL TOTAL									\$1,150,000		
REMEDIAL TOTAL (NET PRESENT VALUE - 5% DISCOUNT RATE)											
Area of Interest	On-Going Remedial System Operation & Site Monitoring							Annual Weighted O&M Cost Estimate	Years of O & M	Total Weighted O&M Cost Estimate	
	Minimal			Moderate			Major				
	Probability	Cost		Probability	Cost		Probability				Cost
All O & M	0.3	\$500,000		0.4	\$1,000,000		0.3	\$1,500,000	\$1,000,000	10	\$10,000,000
O & M Net Present Value (5% Discount Rate)											
TOTAL											\$13,191,250
TOTAL (Net Present Value - 5% Discount Rate)											